International Journal of Food Nutrition and Safety, 2016, 7(1): 1-9

Modern Scientific Press

International Journal of Food Nutrition and Safety **ISSN: 2165-896X**

Journal homepage: www.ModernScientificPress.com/Journals/IJFNS.aspx *Florida, USA*

Article

Rapid Identification of *Salmonella* Typhimurium Using *invA* Gene and Three Genome Regions (*TSR1, TSR2 and TSR3*) in Milk as a Food Model by Multiplex PCR Detection

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Article history: Received 3 September 2015, Received in revised form 10 October 2015, Accepted 12 December 2015, Published 1 January 2016.

Abstract: Contamination of Milk with *Salmonella* is a major risk factor for human health and multiple outbreaks of salmonellosis by milk contamination have been reported. To decrease the time and labor requirements of conventional detection methods, rapid and sensitive methods mainly based on PCR amplification are preferred. The aim of the present study was improvement and optimization of multiplex PCR amplification of serovar-specific genomic regions for the direct detection and serotyping of *Salmonella Typhimurium* in milk. Samples of previously sterilized milk were inoculated with 10 to 10^5 CFU/mL of *S. Typhimurium* LT2 and tested for multiplex PCR of 4 sequences including *invA* gene as the marker of *Salmonella* and 3 SSGRs specific for *S. Typhimurium*. Direct plate counting and parallel PCR with filter-purified extracted DNA were simultaneously performed to validate the results. After several tests the lowest detection limit of the method for milk samples was determined. Although the detection limit was 10 CFU/mL, the sensitivity decreased in this concentration especially for larger PCR products. Results of this study in conjunction with control evaluations proved that this method can be used